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Can we explain increases in young people's psychological distress over time?

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Abstract

This paper aims to explain previously described increases in self-reported psychological distress between 1987 and 2006 among samples identical in respect of age (15 years), school year and geographical location (West of Scotland). Such increases might be explained by changes in *exposure* (changes in levels of risk or protective factors) and/or by changes in *vulnerability* (changes in the relationship between risk/protective factors and psychological distress). Key areas of social change over this time period allow identification of potential explanatory factors, categorised as economic, family, educational, values and lifestyle and represented by variables common to each study. Psychological distress was measured via the 12-item General Health Questionnaire, Likert scored. Analyses were conducted on those with complete data on all variables (N = 3276 of 3929), and separately for males and females. Between 1987 and 2006, levels of almost every potential explanatory factor changed in line with general societal trends. Associations between explanatory factors and GHQ tended to be stronger among females, and at the later date. The strongest associations were with worries, arguments with parents, and, at the later date, school disengagement. The factors which best accounted for the increase in mean GHQ between 1987 and 2006 were arguments with parents, school disengagement, worry about school and, for females, worry about family relationships, reflecting both increasing exposure and vulnerability to these risk factors. A number of limitations to our analysis can be identified. However, our results reinforce the conclusions of others in highlighting the role of family and educational factors as plausible explanations for increases in young people's psychological distress.

Keywords

Psychological distress; GHQ-12; Time-trends; Young people; Explanations; Social change; Exposure; Vulnerability; Scotland; UK; Gender

Introduction

Substantial increases have been identified in a number of psychosocial disorders among young people in most Western countries since the Second World War (Rutter & Smith, 1995a; Fombonne, 1998). However, the findings are not entirely consistent, trends are complex (Maughan, Iervolino, & Collishaw, 2005) and methodological problems include a lack of repeat cross-sectional surveys using the same measure on socially and geographically

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comparable groups of young people (Angold & Costello, 2001). Using data from two studies with samples identical in respect of age (15 years), school year and geographical location, we showed marked increases in self-report 'psychological distress' (GHQ-12 'caseness'), among females between 1987 and 2006 and smaller, but still highly significant increases among males (Sweeting, Young, & West, 2009). The focus of the present paper is on whether these increases in psychological distress can be explained by a range of factors represented by variables common to each study.

We begin our Introduction with a discussion of methodological approaches to explaining increases in mental health problems. This is followed by brief reviews of the literature on time trends in key areas of social change (economic, family, education, values and lifestyle), and associations between these factors and the mental health of young people. The focus, wherever possible, is on the period covered by our own studies (1987–2006); the vast literatures in each of these areas mean that our reviews cannot be comprehensive. However, they demonstrate a broad background of social change against which our own analysis of 15 year olds in 1987 and 2006 is set.

Methodological approaches

The best candidates as explanatory factors are those which have been shown to be related to young people's mental health at an individual level (Rutter, 1995). Increasing mental health problems could be due to the emergence of new risk factors or to increases in the frequency of, or vulnerability to, existing risk factors (Caprara & Rutter, 1995). Alternatively, they may be due to the disappearance or reduction of protective factors. These mechanisms can be thought of in terms of *exposure* (changes in levels of risk/protective factors) and *vulnerability* (which suggests that even if *levels* of a risk factor remain the same, its relationship with mental health may change over time).

One method which has been used to explore whether time trends in mental health can be attributed to particular social changes is to examine relationships between aggregate data over time as, for example, in studies which relate national trends in young people's mental health to trends in the labour market for young people (Lager & Bremberg, 2009). However, since aggregate-level analyses must be regarded with caution (the ecological fallacy) (Piantadosi, Byar, & Green, 1988), a better method is to combine datasets which contain comparable measures of both mental health and candidate explanatory factors and assess whether changes in the former can be 'explained' (in a statistical sense) by changes in the latter. The scarcity of datasets which can be combined in this way means that almost no such analysis has been conducted. One which did combined data from 16 year olds obtained from national UK studies in 1974, 1986 and 1999. An increase in conduct problems over time was only partially explained by the increasing proportions of adolescents living in lone and reconstituted households and in relatively low income families, while the lower proportion living in large families should have decreased conduct problems. Although each factor was associated with conduct problems within each cohort, 'they did little to account for differences in levels of conduct problems *between* cohorts' (Collishaw, Goodman, Pickles, & Maughan, 2007, p. 2586).

Time trends in key areas of social change, and associations between these factors and the mental health of young people reviewed below, allow us to hypothesise about the contribution these changes may have made to trends in young people's mental health.

Economic factors

This potential explanation is based on evidence of differences in mental health according to socioeconomic status or factors such as unemployment. However, overall economic conditions

within the UK improved between 1987 and 2006, which should, if the relationship is with absolute disadvantage, have led to reduced youth distress (Smith & Rutter, 1995). If the mechanism is one associated with relative disadvantage (Wilkinson, 1996), there has been relatively little change in income inequality since around 1990 (UK National Equality Panel et al., 2010). Further, and contrasting with more severe 'mental disorder' (Meltzer, Gatwood, Goodman, & Ford, 2000), there is actually little or no evidence of socioeconomic inequalities in minor psychological morbidity in youth. This is seen in several studies focussing on the GHQ (e.g., McMunn, Bost, Nazroo, & Primatesta, 1998) including our own (West, Macintyre, Annadale, & Hunt, 1990; West & Sweeting, 2003), and other measures of 'well-being', psychosocial health, psychosomatic or malaise symptoms (Modin & Ostberg, 2007; Piko & Fitzpatrick, 2001; West & Sweeting, 2004).

Family factors

Since the 1960s the modal nuclear family of breadwinner father, stay-at-home mother and biologically related children has diversified (Hess, 1995). Focusing on the period covered by the present study, the employment rate among 16–59 year old females rose from 64% in 1988 to 70% in 2006 (Office for National Statistics, 2001; Office for National Statistics, 2006); the norm in contemporary two parent families is for both to work (Green & Parker, 2006). In tandem, the proportion of families with dependent children headed by a lone parent doubled from 13% in 1987 to 25% in 2006 (National Statistics, 2009; Office of Population Censuses and Surveys, 1989). Maternal employment does not appear to have an adverse impact on adolescent well-being, indeed, it may have a positive effect on some outcomes (Aube, Fleury, & Smetana, 2000). In respect of family structure, reviews suggest that children from divorced families tend to have poorer psychological adjustment, self-concept and social competence than those of married parents, but the effect sizes are small and, for some, parental separation or divorce may be positive (Amato, 2000); studies of father absence in adolescence also show mixed effects (East, Jackson, & O'Brien, 2006).

Generally, the evidence is that differences by family structure tend to be accounted for, and/or dwarfed by those in respect of family dynamics (Demo & Acock, 1998; McFarlane, Bellissimo, & Norman, 1995). For example, a large study of English 10–15 year olds found that while family structure explained less than 2% of the variation in subjective well-being, responses to the statement 'my family gets along well together' accounted for over 20% (Rees, Bradshaw, Goswami, & Keung, 2010). Sparse data mean time trends in family dynamics are harder to determine. However, a review of UK-based studies suggests increases in parental monitoring and parental expectations of good behaviour between 1986 and 2006 and in time spent caring for children between the 1960s and 1990s. Set against this, the proportion of teenagers eating family meals fell, while parental self-reported distress increased (Nuffield Foundation, 2009). Studies of trends in parental care and control, known to be key to adolescent mental health (Rigby, Slee, & Martin, 2007), are almost non-existent, although one review paper of trends across nations suggests a general shift towards more authoritative styles (Larson, Wilson, Bradford Brown, Firstenberg, & Verma, 2002), generally associated with positive outcomes, at least in Western societies (Rigby et al., 2007).

Educational factors

It has been argued that over the past 30–40 years, the UK, particularly England, has seen greater use of assessment to try and raise educational standards than anywhere else in the world (Torrance, 2003). Academic work generates worry for schoolchildren of all ages, particularly secondary pupils facing national examinations (Putwain, 2007). In a study which identified 10 dimensions of adolescent stress, four were school-related (stress of school performance, attendance, teacher interaction and school/leisure conflict). The first of these increased significantly with age and was higher among females; all were significantly associated with

psychological distress (Byrne, Davenport, & Mazanov, 2007). Although females have outperformed males at school in most Western countries over the last 20 years or so (Johnson, 2008), they are more likely to underestimate their academic competence (Cole, Martin, Peeke, Seroczynski, & Fier, 1999) and display more anxiety and depression before exams (West & Sweeting, 2003).

A heightened emphasis on achievement in some schools may marginalise and demotivate pupils identified as unlikely to succeed (Fletcher, Bonell, & Rhodes, 2009); adolescents who perceive school as competitive or unfair are more likely to withdraw (Roeser, Eccles, & Sameroff, 2000). School disengagement has been associated with negative psychosocial and behavioural pupil outcomes (Van Ryzin, Gravely, & Roseth, 2009; West, Sweeting, & Leyland, 2004). Between 1990 and 2006, the proportion of Scottish female secondary pupils who liked school a lot dropped from 33% to 29%, while no change was seen for males (23%–22%) (Currie, Levin, Todd, & HBSC National Team, 2008).

Values and lifestyle factors

It has been suggested that the materialism and individualism associated with modern Western cultures are hazardous for mental health (Eckersley, 2006). This issue forms the basis of the UK report ‘A Good Childhood’, which contrasts the many ways in which ‘our children have never lived so well’ with widespread unease about their experience and concerns about their well-being (Layard & Dunn, 2009).

In respect of values, a series of meta-analyses of US studies of children and young people conducted at different times over the latter half of the 20th century highlighted increases in self-reported anxiety, correlations with broader indices suggesting a causal role for decreased social connectedness and increased environmental dangers (e.g., crime rates) (Twenge, 2000). Over this period, locus of control scores became more external, consistent with increases in cynicism and individualism (Twenge, Zhang, & Im, 2004). In 2003 only 24% of UK 12–19 year olds believed that most people could be trusted (Park, Phillips, Johnson, & National Centre for Social Research, 2004). Religious commitment and participation represent one aspect of ‘belonging to something bigger than oneself’ (Layard & Dunn, 2009, p. 84). Both have been associated with subjective well-being, the effects of the latter appearing to reflect more than positive effects of social interaction (La Barbera & Gurhan, 1997). Churchgoing has been declining since at least the mid 19th century, and opinion poll evidence also suggests declining religious belief over recent decades (Voas & Crockett, 2005). Between 1994 and 2003, the proportion of British 12–19 year olds describing themselves as belonging to a religion dropped from 45% to 35% (Park et al., 2004).

While social trust and religious commitment declined, the spending power and commercial involvement of children and young people increased (Schor, 2004; West, Sweeting, Young, & Robins, 2006). Several studies, conducted since 1990, have suggested that materialistic values are related to lowered well-being and life satisfaction (Burroughs & Rindfleisch, 2002; Richins & Dawson, 1992). The commercialisation of childhood has been associated with a range of negative effects (Kramer, 2006). A survey of US 10–13 year olds found relationships between consumer involvement and psychosomatic symptoms, depression, anxiety and (low) self-esteem (Schor, 2004). Materialism has been shown to be related to parent–child conflict and disappointment after the refusal of purchase requests among Dutch 8–12 year olds (Buijzen & Valkenburg, 2003) and to lower opinion of parents and parent–child conflict in UK 9–13 year olds (National Consumer Council, Nairn, Ormrod, & Bottomley, 2007). It has also been linked with emotional/behavioural problems in British 11–19 year olds (Flouri, 2002) and to reduced life satisfaction in Hungarian 14–21 year olds (Piko, 2006), while promoting higher self-esteem appears to reduce materialism among children and adolescents (Chaplin & John, 2007).

A related aspect of consumerism refers to the construction of desirable identities, particularly related to attractiveness. These are promoted by increasingly pervasive media (Monro & Huon, 2005) and felt more strongly by females (Knauss, Paxton, & Alsaker, 2007). However, evidence on the relationship between adolescent mental health and one aspect of appearance, obesity, is mixed, psychological distress appearing more strongly associated with concern about weight and shape, regardless of BMI (Allen, Byrne, Blair, & Davis, 2006; Jansen, van de Looij-Jansen, de Wilde, & Brug, 2008). Given our focus on time trends, the question is whether such concerns have increased or decreased. While it has been suggested that increasing obesity prevalence may have reduced its stigmatisation (Chang & Christakis, 2002), findings are inconsistent (Sweeting, West, & Young, 2008). Among the sparse research addressing changes in satisfaction with appearance more generally, a large Norwegian study of 13–19 year olds found a polarisation between 1992 and 2002, with increasing proportions very dissatisfied and very satisfied (Storvoll, Strandbu, & Wichstrom, 2005).

The second half of the 20th century also saw the emergence of teenagers as a distinct social group with their own cultural territory (Bennett, 2005), and, paralleling this, the rise of youth subcultures (Miles, 2000). Although subcultural affiliation as represented by group membership or music preference has more often been associated with adverse health behaviours, particularly substance use (Forsyth, Barnard, & McKeganey, 1997; Mulder et al., 2009), there is some evidence of relationships with psychological distress. Thus, Goths have been described as a ‘psychosocial high-risk culture’ (Rutledge, Rimer, & Scott, 2008) associated with depression and, among one of our own cohorts, self-harm and suicide (Young, Sweeting, & West, 2006). However, positive effects have also been acknowledged, including the solidarity and collective identity associated with membership of certain subcultural groups, and the use of music to overcome low mood (Bennett, 2005; Kavanaugh & Anderson, 2008).

Young people’s ‘lifestyles’ have changed radically since the mid 20th century. In particular, they have become more leisure/entertainment oriented. One expression of this has been the involvement of young people as (majority) consumers of the ‘night-time’ (bars, pubs, clubs and music venues) which has developed, within the UK at least, since the 1970s (Hollands & Chatterton, 2002); (Chatterton & Hollands, 2002). The ‘going-out’ scene, which, by the end of the 20th century, represented normative behaviour (Eggerton, Williams, & Parker, 2002), begins at a younger age than that of legal access to UK licensed premises, recently encouraged by alcohol-free under-18s events. For the vast majority, the link between ‘going-out’ and intoxication means there are associated risks such as violence and accidents as well as more general physical and psychological substance-related effects (Eggerton et al., 2002).

Another significant aspect of changing youth lifestyles is their increasing involvement with electronic media, involving massive increases in computer and video game use. Computer games have also evolved, the current generation allowing more graphic depictions of violence, and having the ability to connect players virtually (Smyth, 2007). Studies of the association between computer games and psychological well-being have largely focused on aggression, addiction and social isolation. Although the consensus appears to be that, at least in moderation, game-playing has few effects (Griffiths, 2005), there is some evidence that violent games may be related to aggressive and/or antisocial behaviour (Porter & Starcevic, 2007). However, there is no evidence for associations between gaming and the development of depression (Primack, Swanier, Georgiopoulos, Land, & Fine, 2009) or social isolation (Cummings & Vandewater, 2007) among representative adolescent samples. Indeed, gaming can often be a social experience for adolescents (Lenhart et al., 2008) and the advent of player networking facilities means that it may now be associated with large social groupings (Smyth, 2007).

Just as it is possible that changes in economic conditions, family life or educational factors might explain time trends in young people’s mental health, so also might changes in values

and lifestyles. The bulk of the evidence cited above suggests that reduced social trust and religious commitment coupled with increased commercial involvement, focus on appearance, subcultural affiliation, the 'going-out' scene and electronic media might have contributed to increasing mental health problems.

The present study

The present study is set against this broad background of social change. It examines whether the increases in psychological distress observed among 15 year olds between 1987 and 2006 can be explained by a range of factors represented by variables common to each study. These can be categorised as economic (no working parent, shared bedroom, worry about own unemployment), family (not with both birth parents, arguments with parental figures, family outings, worry about family relationships), education (school disengagement, worry about school), values and lifestyle (religious attendance, youth subculture, disco/club attendance, computer game play, spending power, obesity, worry about weight, worry about appearance). These represent both 'objective' factors (as reported by the young people or, in some cases, their parents), together with worries, which are clearly 'subjective'. While it is possible that any relations between 'objective' factors and psychological distress result from that distress, this is much more likely in the case of worries; indeed worrying is one component of our measure of distress. However, they are included because of the public perception that worries, particularly school- and appearance-related, have increased among adolescents over the past couple of decades and mirror wider changes in society.

Our choice of variables was constrained by those available to us. Ideally, we might, for example, have included family income, a measure of parental care and control, or responses to a consumer involvement scale. Instead, we have had to select measures available in both our 1987 and 2006 datasets which best represent aspects of social change. The studies themselves, particularly the earlier one, were initiated with a broad health and lifestyle focus, rather than a consideration of time trends. They are unusual in that they have samples which are equivalent in terms of geographical location, age and educational status, and a wide range of broadly comparable variables.

Methods

Both samples included 15-year olds in their final year of (Scottish) statutory education (S4), resident in the Central Clydeside Conurbation, centred around Glasgow. They comprised the 'West of Scotland Twenty-07 Study: Health in the Community' ('Twenty-07' – (Benzeval et al., 2008)) youth cohort and 'Peers and Levels of Stress' ('PaLS' – (Sweeting, Young, & West, 2008)).

Twenty-07 is a longitudinal study of three age cohorts, the youngest ('youth') cohort being aged 15 when first surveyed in 1987. The study includes two distinct but connected samples. The regional sample was selected as representative of the region as a whole. At baseline, a response rate of 65% (excluding those who had moved prior to first contact) of the issued youth cohort regional sample was obtained (1009 respondents). An examination of bias due to non-response revealed no significant gender or social class differences (Der, 1998). The locality sample, designed for more intensive study of the relationship between people's personal circumstances and the environment in which they lived, comprised virtually all of the population of the relevant age within two contrasting areas (neither at the extremes of social disadvantage). Because our previous studies of increases in psychological distress (Sweeting et al., 2009; West & Sweeting, 2003), were concerned with rates, we based them on data from the regional sample. Since the focus of the present study is on explanations, and therefore more concerned with associations, we base it on data from the regional plus locality samples. This increases the Twenty-07 sample size by 50%. At the age 15 survey, two home interviews were

conducted. The second included the self-completion GHQ-12, returned by 96% of the sample. At the time of this interview, just over half the sample was in their S4 school year, 30% in a higher year and 15% had left school. To maintain comparability with the later study, all respondents not in S4 at mainstream schools were excluded from analysis (resulting $N = 735$, 49% males, mean age 15 years 8 months).

PaLS was a cross-sectional, mainstream school-based study which took place in 2006. The sampling scheme aimed for a representative sample, and within selected schools, all S4 pupils were invited to participate. The total sample comprised 3194 (49% males), mean age 15 years 5 months, representing 81% of those eligible. Respondents completed questionnaires, were briefly interviewed and then measured. Participating schools did not differ significantly from the remainder in the area in respect of a number of socio-demographic dimensions, nor pupil achievement by the end of statutory schooling. However within selected schools, questionnaire completers differed from non-responders in respect of gender and deprivation (Sweeting, Young, et al., 2008).

Measures

Psychological distress was measured via the 12-item General Health Questionnaire (GHQ-12) (Goldberg & Williams, 1988), which has been validated for use with both older (age 17; Banks, 1983) and younger (ages 11–15 (Tait, French, & Hulse, 2003)) adolescents. The GHQ was designed as a measure of state, focussing on inability to carry out normal functions and the emergence of distressing symptoms. Each item includes four answer options and can be scored as a Likert scale (0–3, resulting range 0–36), which we use in the present paper.

Economic factors

Parents working – questions on parental economic activity were included in the parental interview in 1987 and in the interviews with young people in 2006. Responses were used to create a dichotomous variable, one or both parents in full or part-time work versus no working parent or no parental figure. *Shared bedroom* – in 1987, parents were asked whether the young person had their own, or a shared bedroom; the 2006 questionnaire asked ‘do you have your own bedroom?’. Worry *about own unemployment* – questionnaires at both dates included lists of personal concerns, including ‘being unemployed’ (1987) and ‘being unemployed after leaving school’ (2006), recoded to ‘a lot’ versus all other responses (‘a bit’, ‘not at all’ [both dates] and ‘never think about it’ [1987 only]).

Family factors

Parental structure – information obtained via parental (1987) and pupil (2006) interview was used to define participants as living with both birth parents versus any other situation. *Arguments with parental figures* – in 1987, the young person’s interview included ten items relating to ‘disagreements or arguments with parents’ over various issues (e.g., ‘doing your homework’, ‘what you spend your money on’), and scored 1–12. The 2006 questionnaire included a single item asking ‘how often do you have disagreements or arguments with your parents/guardians about things like homework or tidiness’, scored 1–5. After recoding the 12-point 1987 responses to match the 5-point 2006 one as closely as possible (more than daily or daily = every day; four to six or two to three days a week = most days; weekly = weekly; fortnightly, monthly, three monthly, six monthly, yearly or less than yearly = less often; never = never), a mean argument score (range 1–5) was derived for 1987, comparable to the single item in 2006. *Out with family* – the 1987 interview asked how often the young person and their family did five activities together, including ‘take a walk/play sport’, ‘go out (e.g., eat out/cinema)’, ‘visit relatives or family friends’. The 2006 questionnaire included the single item ‘go out together with my family’. The scoring options at each date were as for the

'arguments' variables, so the 12-point 1987 responses were recoded to 5-points and a mean 'out with family' score derived, comparable to the single item in 2006. *Worry about family relationships* – the item 'how your (1987)/my (2006) family get on with each other' among the list of personal concerns was recoded to 'a lot' versus less worry.

Educational factors

School disengagement – the items 'if I get the chance to skip (dog) school, I do', 'I feel school is largely (1987)/think school is (2006) a waste of time' and 'I like school', each scored on a 4-point scale ('very true' to 'very untrue' in 1987 and 'strongly agree' to 'strongly disagree' in 2006) were summed to create a scale, higher scores representing greater disengagement. *Worry about school* – the personal concern 'doing well at school' was recoded to 'a lot' versus less worry.

Values and lifestyle factors

Religious attendance – in the 1987 interview, an item on religious attendance was included, all those not belonging to a religious group or church being coded as never attenders. The 2006 questionnaire included 'go to the church, mosque or temple' among a range of leisure activities. These variables were recoded to represent weekly or more frequent (versus less frequent) religious attendance. *Youth subculture* – at both dates respondents were asked how much they identified with a date-appropriate (and so varying) range of youth subcultures, via a 4-point scale in 1987 ('not at all', 'a bit', 'quite a bit', 'I am one') and 3-point scale in 2006 ('not at all', 'a bit', 'a lot'). Those identifying as 'quite a bit' or 'I am one' (1987) and 'a lot' (2006) with 'mods', 'new wave', 'new romantics' or 'trendies' (1987) and 'clubbers/clubscene', 'dance/rave' or 'neds/populars' (2006) were categorised as 'mainstream'. This was trumped by any 'alternative' subcultural identification; 'punks', 'skinheads/skins', 'heavy metal', 'breakers/break dancers' or 'hippies' (1987) and 'punks/nu-punk', 'goth/industrial/Marilyn Manson', 'skater/skatepunk', 'mosher/heavy metal' or 'hip-hop/rap' (2006). The result was a three-category variable (no, mainstream or alternative identification). *Discos/clubs* – at both dates, respondents were asked how frequently they engaged in a range of leisure activities including 'go to a disco' (1987) and 'go to discos or clubs' (2006). The 12-point (1987) and 5-point (2006) frequency options were recoded to binary variables representing discos/clubs weekly or more (versus less frequent). *Computer games* – the leisure activity lists also asked how often respondents would 'do home computing or video games' (1987) and 'play computer games/games consoles' (2006), again collapsed into binary variables representing computer games weekly or more (versus less frequent). *Spending power* – the 1987 interview asked whether respondents received pocket money, other money from parents or relatives or from a paid job, and if so how much per week. The 2006 questionnaire asked about money received each week as pocket money, from household jobs and from a regular paid job. In order to more accurately reflect 'spending power' at each date, the total amount (means = £6.46 and £19.14 in 1987 and 2006) was translated into pence (to avoid small numbers) and divided by the relevant UK Composite Price Index. This is based on data from both official and unofficial sources, represents the purchasing power of the pound over time, and has replaced previous long-run inflation indices (O'Donoghue, Goulding, & Allen, 2004). With a reference of 100 (January 1974), the index was 402.0 in 1987 (O'Donoghue et al., 2004) and 781.5 in 2006 (Office for National Statistics, 2009). *Obesity* – respondents were weighed and measured in both surveys (indoor clothes with no footwear) BMI (kg/m^2) was converted into standard deviation scores compared to the UK 1990 growth reference (Cole, Freeman, & Preece, 1995), those above the 95th percentile for age and sex being defined as obese. *Worry about weight* – the 1987 list of personal concerns included 'your weight' but, in 2006, two weight-related worry items were included, 'being overweight' and 'being too thin'. Since it is possible that some endorsing the weight item in the earlier study were worried about underweight, a 'weight worries' variable was defined as those reporting 'a lot' of worry about 'weight' (1987)

and about either 'overweight' or 'thin' (2006). *Worry about appearance* – the item 'your (1987)/my (2006) looks' among the list of personal concerns was recoded to 'a lot' versus less worry.

Analyses

All analyses were conducted on those with complete data on all variables, so reducing the sample sizes to 649 (1987) and 2627 (2006). There were no sex differences in respect of those included or excluded in the analyses, but those included were more likely to have working parents (90% versus 83%, $p < .001$) and had lower GHQ Likert scores (mean 10.6 versus 11.4, $p < .001$). Probabilistic weights have been constructed to compensate for socio-demographic differences between responders and non-responders in the 'PaLS' (2006) study (Sweeting, Young, et al., 2008). Since the results of analyses conducted using weighted and unweighted data were very similar, those based on unweighted data are presented here.

Analyses were conducted separately for males and females since, as demonstrated previously, increases in GHQ were greater for females (the sex by date interaction in respect of GHQ Likert score was significant $p < .001$).

Analyses began with descriptive statistics on each of the potential explanatory variables, testing for differences between the two dates; if significant these would indicate increases or decreases in potential stressors. GLM was then used to test for their association with GHQ score and for any interactions with date. A significant interaction indicating that a factor was associated with a greater increase in GHQ score at the later date would provide prima facie evidence for the vulnerability mechanism. Thereafter, a series of regression models was used to further explore the extent to which the exposure and vulnerability mechanisms explained increased GHQ scores over time. As the exposure mechanism is more parsimonious, this was explored first. The models are described in more detail below. Because of the large number of analyses, we focus on significance levels of $p < .01$.

Results

Basic distributions of GHQ 'caseness' and all potential explanatory variables for males and females at each date, with the significance of the 1987–2006 differences are shown in Tables 1 and 2 (categorical variables – numbers, percentages and significance of chi-square) and 2 (continuous variables – means, SDs, numbers and significance of F). As Table 2 shows, mean GHQ score increased by 0.98 points (8.49–9.47) among males and by 2.75 (9.66–12.41) among females; the spread of scores was also larger at the later date, as evidenced by the larger SDs.

Patterns of change in exposure over time in the potential explanatory variables were very similar for males and females. Among the 'economic' variables, there were decreases in the proportions with no working parent(s), sharing a bedroom and in those expressing 'a lot' of worry about own unemployment. Overall, these results are consistent with a pattern of reduced economic hardship over the twenty year period.

There were increases in the proportion not living with both birth parents and in the frequency of arguments with parents and family outings (Table 2). These changes were accompanied by increased worry about family relationships; 'a lot of worry' expressed by 9% of males and 14% of females in 1987, rising to 14% and 20% in 2006. With the exception of outings, these results suggest an overall weakening of family life with time.

School disengagement increased for both males and females (Table 2). Females were also more likely to report a lot of worry about schoolwork at the later date (40% rising to 51%); no such

increase was seen for males. Overall, these results show increased disengagement from, and, among females, increased concerns about school.

The proportion reporting weekly or more frequent religious attendance dropped from around 40% males and 50% females in 1987 to fewer than 20% in 2006. In contrast, involvement in youth subculture more than doubled (21%–49%) among males and tripled (17%–54%) among females, this being almost wholly attributable to the dramatic increase in alternative styles, such as punk, goth, heavy metal or hip-hop. Sharp increases in disco or club attendance also occurred. While markedly more frequent among males at each date, increases in computer game play occurred for both males and females. Spending power (Table 2) also increased; the ratio of personal income from pocket and earned money to the UK Composite Price Index rising by around 50%. Finally, obesity rates were over twice as high in 2006 than in 1987, while the proportions worrying about weight increased from 5% to 20% (males) and 32%–42% (females), with similar large increases in worries about looks (13%–20% among males; 21%–42% among females).

Table 3 shows bivariate associations between each potential explanatory variable and GHQ Likert score (expressed as unadjusted B) for males and females at each date and the significance of each date-by-explanatory-variable-interaction. Overall, it can be seen that associations were generally stronger in 2006, particularly among females.

For males, there were no associations between GHQ and the economic variables, except that in 2006 those with a lot of worry about unemployment had higher GHQ scores. Among females, those who shared a bedroom had lower scores at both dates, and, as with males, those with a lot of worry about unemployment had higher GHQ in 2006. The lack of association between worries about employment and GHQ in 1987 was significantly different from the strong association in 2006 among females.

Among the family variables, females not living with both birth parents had higher GHQ scores in 2006. At this date those who reported more arguments with parents and a lot of worry about family relationships also had higher GHQ, while those reporting more frequent family outings had lower scores. Among females, the lack of a relationship between both arguments and worry about family relationships and GHQ in 1987 contrasted strongly with the strong associations in 2006.

School disengagement was associated with higher GHQ among both males and females in 2006, but there was no such relationship among females in 1987. Those with a lot of worry about school had higher scores at both dates.

Variables representing values and lifestyles had fewer relationships with GHQ at both time points; indeed there were none between GHQ and religious attendance, discos/clubs, computer games, spending power or obesity. In 2006, GHQ scores were higher among females who identified with an alternative youth culture. Worries about weight and looks were also associated with higher GHQ among both males and females in 2006, with associations at the earlier date for worries about looks among males. Among females, relationships with both appearance worries were significantly stronger at the later date.

We went on to address the question of whether changing rates of these factors (i.e., exposure to them) can help explain time trends in psychological distress by examining their effect on the date difference in GHQ score. Table 4 shows the difference in mean GHQ between 1987 and 2006, first unadjusted and then after adjustment for the potential explanatory variables.

Among males, adjustment for worry about unemployment was the only economic variable to have more than a very marginal impact, *increasing* the mean difference from 0.98 to 1.08. This

occurred because worries were positively associated with GHQ, but less frequent in 2006. Among females, adjusting for sharing a bedroom, which was protective, but decreased over time, reduced the mean difference from 2.75 to 2.48. Adjustment for the family variable arguments with parents had by far the largest impact, reducing the mean GHQ difference to insignificance among males. Conversely, family outings increased the difference somewhat in both sexes. Adjustment for school disengagement also had a marked effect, reducing the difference by around 30%. Among the variables representing values and lifestyles, adjustment for youth culture reduced the GHQ difference among females, while computer games increased it among males. Adjustment for worries about both weight and looks also reduced the difference. Entering all variables reduced the mean difference by around 75% for both males (to 0.22, $p = .496$) and females (to 0.71, $p = .054$). Adjustment for more 'objective' factors (i.e., excluding worries) had a similar effect. In contrast, entering the five worries reduced the mean difference by around 20%, to 0.80 ($p = .003$) among males and 2.11 ($p < .001$) among females.

In order to estimate the cumulative impact of each potential explanatory variable, we also fitted them in a hierarchical regression model. Our strategy was to include first the variable which most reduced (i.e., 'explained') the date difference in mean GHQ score, followed by that yielding the greatest further reduction, and so on until all variables were included. Fig. 1 shows the results for males and females separately. Each graph takes the form of a U-shaped curve, since the variables generating the steepest decline in mean GHQ difference were entered first, then those generating shallower declines and finally those generating inclines (that is, variables which *increased* the difference between the two time points). Equivalence in the axes highlights the much greater increase in mean GHQ over time among females.

For both males and females, the first three factors selected were the same: arguments with parents (which reduced the mean GHQ difference to 0.18 [$p = .521$] among males and to 1.16 [$p = .001$] among females); school disengagement (which further reduced the GHQ difference to 0.06 [$p = .833$] among males and 0.82 [$p = .017$] among females) and worries about school (resulting GHQ difference −0.06 [$p = .839$] among males and 0.49 [$p = .136$] among females).

Thereafter the model for males added seven further factors which each reduced the difference in mean GHQ: shared bedroom; worries about looks, unemployment and family relationships; obese; with both birth parents; and finally working parent(s). At this point the resulting GHQ difference was −0.22 [$p = .434$]. The model then added those factors which increased the difference in mean GHQ: worries about weight; discos/clubs; youth culture; spending power; religious attendance; family outings; and computer games. Similarly, the model for females added five factors which reduced the difference in mean GHQ: shared bedroom; with both birth parents; youth culture; worries about looks; and obese (resulting GHQ difference = 0.079 [$p = .820$]). Factors which, when added to the female model, increased the difference in mean GHQ were: discos/clubs; working parent(s); worries about weight and unemployment; computer games; worries about family relationships; religious attendance; spending power; and family outings.

Table 4 and Fig. 1 might be interpreted as suggesting that a very small number of factors 'explain' the increase in GHQ between 1987 and 2006. However, the point they also make is that young people have been subject to a range of social changes, some of which appear to have contributed to the increase in psychological distress, while others should have contributed to a reduction.

They also represent the results of main effect models and thus *exposure* mechanisms (changes in levels of risk/protective factors). The results show that changes in exposure are sufficient to explain increases in GHQ in the sense that the date difference is no longer statistically

significant after adjusting for them. However, we have also shown (Table 3) that the relationship which some factors had with GHQ changed significantly between 1987 and 2006. This suggests differences in *vulnerability*.

To test the extent to which vulnerability added explanatory power, significant date interactions (Table 3) were introduced into a model containing all the main effects and selected via backwards elimination. For males, only worries about school retained a significant interaction with date. For females, interactions with date for worries about family relationships, worries about school and school disengagement all remained significant. The 1987–2006 GHQ differences implied by these interactions are shown in Table 5, both with and without adjustment for all main effects (full set of parameter estimates available from the authors).

Table 5 shows that among males with little or no worry about school, the mean GHQ increase was small and non-significant (difference before adjustment = 0.45, $p = .175$); among those with a lot of worry it was much larger (1.72, p = <0.001). Among females, those who had no worries about family relationships or school and had higher school engagement (defined for the purpose of these analyses as the 1987 mean school disengagement score) had *no* significant GHQ increase (difference before adjustment = 0.23, $p = .594$). In contrast, among those who had a lot of worries about family relationships, but were not worried about school and had higher school engagement, there was a large increase in GHQ scores (difference = 4.38, $p < .001$). GHQ scores increased by much less (1.41 and 1.02 points respectively) among those with only a lot of worry about school, and those with only lower school engagement (defined as the 2006 mean school disengagement score). These estimates are additive. Thus, as the Table shows, the mean GHQ increase before adjustment for females who had a lot of worries about family relationships *and* about school *and* who had lower school engagement, was very large indeed (6.36, $p = <0.001$). Among both males and females, adjustment for all main effects lowered the estimates. As a result, among females with only a lot of worry about school or lower school engagement, GHQ increases were rendered insignificant in the fully adjusted model.

Discussion

This paper uses data on 15 year olds in 1987 and 2006 in an attempt to explain previously demonstrated increases in psychological distress (Sweeting et al., 2009) over this time period. Such increases might be explained by changes in *exposure* and/or by changes in *vulnerability*. A range of potential explanatory variables, chosen to represent aspects of social change (categorised as economic, family, educational, values and lifestyle factors) and common to each dataset were examined.

With only one exception (male worry about doing well at school), levels of every potential explanatory factor had changed over the 19 year time period in line with what would be expected from the literature and general societal trends. Worries about particular issues also mirrored societal trends (decreases in respect of unemployment, increases in respect of family relationships, school, weight and looks), suggesting that they were not simply an indication of generally greater willingness to express worry. Many changes were very large indeed, highlighting massive changes in the lives of young people around the turn of the millennium. However, in order to qualify as a potential explanation for observed increases in psychological distress, any factor would also need to be associated with psychological distress at one or both time points. This was not the case for several including, for both males and females, no working parent, religious attendance, going out to discos or clubs, spending power and rates of obesity. Irrespective of changes in exposure, because our analyses showed these were not risk or protective factors, we would not expect such variables to contribute towards explaining increases in GHQ. This was demonstrated in the analyses which showed adjustment for these

variables tended to have little or no impact on the GHQ increase between the 2006 and 1987. These analyses highlighted arguments with parents as explaining a large proportion of the increase, and suggested that changes in more 'objective' factors were a better explanation of the increase than worries. However these were main effects models and so only reflect changing exposures. Such models cannot capture changes in vulnerability; that is, that some factors had a stronger relationship with GHQ at the later date.

Changes in vulnerability were particularly evident among females among whom some worries were, rather curiously, not a risk factor for GHQ in 1987. However, in the final, mutually adjusted models, evidence for increasing vulnerability remained only in respect of educational factors (school worries) among males, and both family (worries about family relationships) and educational factors (school worries and disengagement) among females. A key finding is therefore the large impact of vulnerability, demonstrating that there was not an across-the-board increase in psychological distress. The greater impact of school factors on young people's psychological distress at the later date may have resulted from the increasing policy emphasis on education, coupled with media reports relating to school league tables, increasing statutory examination passes and numbers in higher education. Each of these may have acted to push school-related issues higher up young people's own agendas (West & Sweeting, 2003). However, it is harder to explain the greater impact of worries about family relationships, among females only, at the later date.

One difficulty with any analysis such as ours is that measures are less than ideal. Such analyses require equivalent measures at each time point, generally lacking unless studies have been set up specifically to examine time trends. However, we are aware of no such studies in respect of long-term trends in psychosocial disorders in young people. This is not surprising, since it is only in the past decade or two that such trends have received academic attention (Rutter & Smith, 1995a); (Fombonne, 1998). The result is that analyses which attempt to explain them must do the best they can with datasets which do not necessarily include either ideal or identical items. Variables representing consumer involvement, peer relationships, substance use, other comorbid mental health problems or parental mental health might have explained a significant proportion of the increase in psychological distress. In respect of identical items, the different methodology of the 2006 study compared with the earlier one meant that we were unable to always include directly comparable items. The variables which differed most were 'arguments with parental figures' and 'out with family', represented by several items based on 12-point frequency scales in 1987, but single items using 5-point frequency scales in 2006. It is possible that our results, particularly those pointing to the importance of increased arguments with parents in explaining increasing psychological distress, partly reflect this methodological difference.

Even if studies are set up with the express purpose of explaining time trends and so include identical items, the meaning of those items may change over time. As an example, contemporary computer game play is not the same as computer game play in the 1970s or 1980s in terms of either content or of what it means to be a player. To some extent, this may be captured by analyses which focus on vulnerability, thus recognising the potential for different relationships with psychological distress at each time point. On the other hand, including only identical items would ignore newly emerging factors. In the current study, this problem is highlighted by the change in youth subcultural groupings between 1987 and 2006. In 1987 'Marilyn Manson' or 'rap' had not been heard of and the list of youth subcultures did not include Goths, while by 2006, 'new wave' or 'trendies' were things of the past. In order to overcome this problem, groupings were collapsed into two broad categories ('mainstream' and 'alternative') which aimed to represent similar meanings or 'types' of young people at each time point.

Since our analyses were based on cross-sectional data and the majority of the data at both dates was self-report, the assignment of causality and its direction are uncertain. For example, while our analyses suggest that trends towards increased arguments with parents can explain a large proportion of the increases in GHQ scores between 1987 and 2006, it is possible that the direction of causality may be the reverse. Perhaps increased GHQ scores at the later date explain increases in the actual or reported frequency of arguments over time.

In their influential work on time trends, Rutter and Smith concluded that rising levels of disorder over the second half of the 20th century could not be accounted for by economic conditions, the mass media or a general moral decline, but that increasing levels of family discord, changing patterns of transitions in adolescence (e.g., increasing youth culture and isolation from adults), increasing expectations (associated with increasing affluence) and individualism may have played a role. They also suggested that young people may experience greater stress than in the past, citing educational stressors resulting from the prolongation of education as one example (Rutter & Smith, 1995b). Although based on very different methods, our results parallel these conclusions in many ways. We found little role for economic factors. Changing values and lifestyles explained a small portion of the increase, family process and educational factors, by far the most.

Rutter and Smith suggest that “researchers sometimes slide into the easy, comforting, assumption that causal hypotheses cannot be tested in the social sciences” (Rutter, 1995, p. 7), but that “the challenge now is to devise effective tests of the likely hypotheses, to determine the probable causal mechanisms” behind time trends in psychosocial disorders in young people (Rutter & Smith, 1995b, p. 807). The strengths of this paper are that it identifies variables representing large scale social change in two large studies conducted 20 years apart, and uses individual- rather than aggregate-level analyses to examine whether those variables explain increases in psychological distress. While the analysis is not without its problems, and the results come with several caveats, in identifying the potential significance of family process and educational factors, our findings suggest important areas for future researchers seeking to explain increases in young people’s psychological distress.

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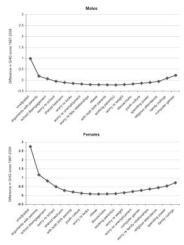

Fig. 1.
Difference in GHQ Likert score between 1987 and 2006 – unadjusted and after fitting potential explanatory variables cumulatively in a hierarchical regression beginning with that which most reduced the date difference, followed by that which yielded the greatest further reduction, etc – males and females.

Table 1

Basic distributions of GHQ 'caseness' and all categorical explanatory variables – males and females at each date, with the significance of differences.

	Males					Females				
	1987		2006		(Sig of χ^2)	1987		2006		(Sig of χ^2)
	N	*%*	*N*	*%*		*N*	*%*	*N*	*%*	
GHQ case	41	*13.2*	280	*21.3*		59	*17.4*	550	*41.9*	
Non-case	269	*86.8*	1035	*78.7*	*.001*	280	*82.6*	762	*58.1*	*<.001*
Working parent(s)	260	*83.9*	1211	*92.1*		287	*84.7*	1199	*91.4*	
No working parent	50	*16.1*	104	*7.9*	*<.001*	52	*15.3*	113	*8.6*	*<.001*
Own bedroom	199	*64.2*	1096	*83.3*		206	*60.8*	1053	*80.3*	
Shared bedroom	111	*35.8*	219	*16.7*	*<.001*	133	*39.2*	259	*19.7*	*<.001*
Little/no worry about unemployment	199	*64.2*	990	*75.3*		219	*64.6*	938	*71.5*	
Lot of worry	111	*35.8*	325	*24.7*	*<.001*	120	*35.4*	374	*28.5*	*.013*
With both birth parents	247	*79.7*	974	*74.1*		275	*81.1*	897	*68.4*	
Not with both	63	*20.3*	341	*25.9*	*.040*	64	*18.9*	415	*31.6*	*<.001*
Little/no worry about family relationships	283	*91.3*	1124	*85.5*		293	*86.4*	1051	*80.1*	
Lot of worry	27	*8.7*	191	*14.5*	*.007*	46	*13.6*	261	*19.9*	*.008*
Little/no worry about school	201	*64.8*	804	*61.1*		194	*57.2*	643	*49.0*	
Lot of worry	109	*35.2*	511	*38.9*	*.228*	145	*42.8*	669	*51.0*	*.007*
Religious attendance less than weekly	201	*64.8*	1078	*82.0*		184	*54.3*	1078	*82.2*	
Weekly or more	109	*35.2*	237	*18.0*	*<.001*	155	*45.7*	234	*17.8*	*<.001*
No youth subculture	243	*78.4*	672	*51.1*		279	*82.3*	599	*45.7*	
Mainstream	34	*11.0*	140	*10.6*		55	*16.2*	135	*10.3*	
Alternative	33	*10.6*	503	*38.3*	*<.001*	5	*1.5*	578	*44.1*	*<.001*
Discos/clubs less than weekly	290	*93.5*	1011	*76.9*		302	*89.1*	883	*67.3*	
Weekly or more	20	*6.5*	304	*23.1*	*<.001*	37	*10.9*	429	*32.7*	*<.001*

	Males					Females				
	1987		2006		(Sig of χ^2)	1987		2006		(Sig of χ^2)
	N	*%*	*N*	*%*		*N*	*%*	*N*	*%*	
Computer games less than weekly	185	*59.7*	300	*22.8*		305	*90.0*	921	*70.2*	
Weekly or more	125	*40.3*	1015	*77.2*	*<.001*	34	*10.0*	391	*29.8*	*<.001*
Not obese	287	*92.6*	1108	*84.3*		319	*94.1*	1122	*85.5*	
Obese	23	*7.4*	207	*15.7*	*<.001*	20	*5.9*	190	*14.5*	*<.001*
Little/no worry about weight	294	*94.8*	1051	*79.9*		232	*68.4*	761	*58.0*	
Lot of worry	16	*5.2*	264	*20.1*	*<.001*	107	*31.6*	551	*42.0*	*<.001*
Little/no worry about looks	269	*86.8*	1046	*79.5*		267	*78.8*	764	*58.2*	
Lot of worry	41	*13.2*	269	*20.5*	*.004*	72	*21.2*	548	*41.8*	*<.001*
N	*310*		*1315*			*339*		*1312*		

Table 2

Mean GHQ Likert scores and continuous explanatory variables – males and females at each date, with the significance of differences.

	Males			**Females**		
	1987	**2006**	**(Sig of *F*)**	**1987**	**2006**	**(Sig of *F*)**
GHQ Likert score						
Mean	8.49	9.47		9.66	12.41	
SD	*3.04*	*4.63*	*(<.001)*	*3.99*	*5.56*	*(<.001)*
Arguments with parents						
Mean	2.11	2.88		1.99	3.11	
SD	*.71*	*1.04*	*(<.001)*	*.64*	*1.07*	*(<.001)*
Family outings						
Mean	1.93	2.38		1.89	2.32	
SD	*.47*	*.81*	*(<.001)*	*.43*	*.85*	*(<.001)*
School disengagement						
Mean	5.24	6.34		4.93	6.18	
SD	1.74	1.77	*(<.001)*	*1.74*	*1.76*	*(<.001)*
Spending power						
Mean	1.55	2.53		1.59	2.32	
SD	*1.16*	*2.50*	*(<.001)*	*1.27*	*2.01*	*(<.001)*
N	*310*	*1315*		*339*	*1312*	

Table 3

Bivariate associations between each potential explanatory variable and GHQ Likert score (unstandardised B and significance) for males and females at each date and significance of each variable by date interaction.

	Males					Females				
	1987		2006		(Signif of int. with date)	1987		2006		(Signif of int. with date)
	B	(Sig)	B	(Sig)		B	(Sig)	B	(Sig)	
Economic factors										
No working parent	−0.51	*(.275)*	−0.02	*(.957)*	*(.547)*	−0.53	*(.376)*	0.92	*(.093)*	*(.126)*
Shared bedroom	0.06	*(.859)*	−0.43	*(.206)*	*(.416)*	−1.15	*(.009)*	−1.52	*(<.001)*	*(.597)*
Lot of worry about unemployment	−0.06	*(.863)*	1.10	*(<.001)*	*(.048)*	−0.32	*(.484)*	2.41	*(<.001)*	*(<.001)*
Family factors										
Not with both birth parents	−0.56	*(.196)*	0.35	*(.227)*	*(.179)*	0.45	*(.414)*	1.19	*(<.001)*	*(.356)*
Arguments with parents (scale)	0.53	*(.029)*	1.12	*(<.001)*	*(.099)*	0.29	*(.390)*	1.52	*(<.001)*	*(.007)*
Family outings (scale)	0.12	*(.744)*	−0.53	*(.001)*	*(.232)*	0.36	*(.474)*	−0.87	*(<.001)*	*(.074)*
Lot of worry about family relationships	2.46	*(<.001)*	1.22	*(.001)*	*(.185)*	−0.39	*(.538)*	4.35	*(<.001)*	*(<.001)*
School factors										
School disengagement (scale)	0.18	*(.068)*	0.28	*(<.001)*	*(.510)*	0.08	*(.509)*	0.76	*(<.001)*	*(<.001)*
Lot of worry about school	0.98	*(.006)*	2.25	*(<.001)*	*(.024)*	1.15	*(.008)*	2.45	*(<.001)*	*(.042)*
Values and lifestyle factors										
Religious attendance weekly or more	0.01	*(.983)*	0.26	*(.426)*	*(.673)*	−0.21	*(.626)*	−0.10	*(.793)*	*(.876)*
Mainstream youth culture	0.72	*(.198)*	−0.25	*(.569)*	*(.283)*	−0.48	*(.416)*	0.61	*(.250)*	*(.240)*
Alternative youth culture	0.12	*(.837)*	0.01	*(.955)*	*(.906)*	−1.97	*(.275)*	0.89	*(.006)*	*(.233)*
Discos/clubs weekly or more	−0.42	*(.553)*	0.18	*(.548)*	*(.569)*	−0.32	*(.646)*	0.57	*(.079)*	*(.356)*
Compute games weekly or more	−0.42	*(.234)*	−0.72	*(.018)*	*(.607)*	−0.57	*(.427)*	−0.48	*(.151)*	*(.927)*
Spending power (scale)	0.18	*(.217)*	−0.05	*(.286)*	*(.278)*	−0.23	*(.168)*	−0.12	*(.129)*	*(.614)*
Obese	0.55	*(.404)*	−0.05	*(.891)*	*(.551)*	0.46	*(.615)*	0.16	*(.713)*	*(.814)*
Lot of worry about weight	0.54	*(.492)*	0.96	*(.002)*	*(.713)*	0.98	*(.035)*	2.72	*(<.001)*	*(.009)*
Lot of worry about looks	1.51	*(.003)*	2.27	*(<.001)*	*(.333)*	0.60	*(.256)*	2.89	*(<.001)*	*(.002)*
N	*310*		*1315*		*1625*	*339*		*1312*		*1651*

Table 4

Difference in GHQ Likert score between 1987 and 2006 (unstandardised B and significance) − unadjusted (first row) and after adjustment for potential explanatory variables – males and females.

	Males		Females	
	B	**(sig)**	**B**	**(sig)**
Unadjusted	0.98	*(<.001)*	2.75	*(<.001)*
After adjustment for …				
Economic factors				
No working parent(s)	0.97	*(<.001)*	2.78	*(<.001)*
Shared bedroom	0.93	*(.001)*	2.48	*(<.001)*
Worry about unemployment	1.08	*(<.001)*	2.88	*(<.001)*
Family factors				
Not with both birth parents	0.97	*(<.001)*	2.61	*(<.001)*
Arguments with parents (scale)	0.18	*(.521)*	1.16	*(.001)*
Family outings (scale)	1.20	*(<.001)*	3.09	*(<.001)*
Worry about family relationships	0.90	*(.001)*	2.52	*(<.001)*
School factors				
School disengagement (scale)	0.69	*(.014)*	1.97	*(<.001)*
Worry about school	0.91	*(.001)*	2.57	*(<.001)*
Values and lifestyle factors				
Religious attendance – weekly	1.02	*(<.001)*	2.71	*(<.001)*
Youth subculture	0.97	*(.001)*	2.43	*(<.001)*
Discos/clubs – weekly	0.96	*(.001)*	2.65	*(<.001)*
Computer games – weekly	1.22	*(<.001)*	2.85	*(<.001)*
Spending power (scale)	1.03	*(<.001)*	2.85	*(<.001)*
Obese	0.98	*(<.001)*	2.73	*(<.001)*
Worry about weight	0.84	*(.002)*	2.50	*(<.001)*
Worry about looks	0.83	*(.002)*	2.23	*(<.001)*
All factors	0.22	*(.496)*	0.71	*(.054)*
All factors excluding worries	0.36	*(.280)*	0.69	*(.076)*
All worries	0.80	*(.003)*	2.11	*(<.001)*
N	*1625*		*1651*	

Table 5

Estimates for date differences in GHQ Likert scores before and after adjustment for all main effects – males and females.

Parameter	Estimate	SE	*t*	(sig of *t*)
Males				
Before adjustment				
Little/no worry about school	0.45	0.34	1.36	*(.175)*
Lot of worry about school	1.72	0.45	3.84	*(<.001)*
After full adjustment				
Little/no worry about school	−0.22	0.37	−0.59	*(.552)*
Lot of worry about school	1.03	0.47	2.19	*(.028)*
Females				
Before adjustment				
Little/no worry about family + little/no worry about school + 1987 mean school disengagement score	0.23	0.42	0.53	*(.594)*
Lot of worry about family + little/no worry about school + 1987 mean school disengagement score	4.38	0.88	5.00	*(<.001)*
Little/no worry about family + lot of worry about school + 1987 mean school disengagement score	1.41	0.49	2.90	*(.004)*
Little/no worry about family + little/no worry about school + 2006 mean school disengagement score	1.02	0.42	2.42	*(.016)*
Lot of worry about family + lot of worry about school + 2006 mean school disengagement score	6.36	0.85	7.50	*(<.001)*
After full adjustment				
Little/no worry about family + little/no worry about school + 1987 mean school disengagement score	−0.39	0.45	−0.86	*(.390)*
Lot of worry about family + little/no worry about school + 1987 mean school disengagement score	3.70	0.88	4.22	*(<.001)*
Little/no worry about family + lot of worry about school + 1987 mean school disengagement score	0.80	0.52	1.53	*(.127)*
Little/no worry about family + little/no worry about school + 2006 mean school disengagement score	0.15	0.46	0.32	*(.748)*
Lot of worry about family + lot of worry about school + 2006 mean school disengagement score	5.43	0.86	6.31	*(<.001)*